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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,931	11/25/2003	Karl Barth	P03,0464	8344

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EXAMINER	
LIEW, ALEX KOK SOON	
ART UNIT	**PAPER NUMBER**
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/721,931	BARTH ET AL.	
	Examiner	Art Unit	
	Alex Liew	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 August 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

The amendment filed on August 21, 2007 is entered and made of record.

Response to Applicant's Arguments

1. On page 10, the applicant stated:

Therefore, the representation shown in Fig. 9 of Crook reference does constitute a "computationally uncurved and flattened" (i.e. "unrolled") representation of the segmented curved surface into a plane.

Therefore, regardless of the teachings of the Herrington reference, the Crook reference does not disclose the "segmenting" and "transforming" and "producing a third volume data set" steps of claim 1.

The examiner agrees with the applicant where Crook does not disclose "computationally uncurved and flattened" (i.e. "unrolled") representation of the segmented curved surface into a plane in the amended claim 1. However, in an updated search, the examiner found Staehle (US pat no 7,120,298); Staehle discloses computationally uncurved and flattened representation of the segmented curved surface into a plane (the image in figure 4 is read as the curved image plane; the image in figure 4a is read as uncurved image plane).

2. On pages 10 and 11, the applicant stated:

Moreover, Applicants do not agree with the Examiner's conclusions regarding the teachings of the Herrington article. The Herrington article discloses, in Figure 3 and 4

and in the associated description, an automatic radial filtering. The purpose of filtering in the subject matter disclosed and claimed in the present application, based on the expected distance from the surface of structured that are of no interest, is to limit such filtering to a predefined area of interest ...

The examiner does not agree with the applicant, on how the following limitation is written: "based on features associated with said structures of interest, and based on excepted distances from the surface of the structures of no interest" does not responds to what is disclosed in the specification on page 5, line 22 to page 6, line 4. Knowing the location of the organs deep within the skin does not mean one may know the expected distance from the surface of the skin to the organ. The examiner suggest the applicant to amend claim 1 to include "filtering to a predefined area of interest," to clear up the meaning of the claim. Also the reading of the third limitation of amended claim 1 is redundant; for example, repeating "structures of no interest of the subject," "structures of interest" and "excepted distance" several times are not necessary to capture the scope of the invention.

In an updated search, the examiner found Uppaluri (US pat no 2003/0103665). Uppaluri discloses producing a data set by filtering the second data set to filter out structures of no interest of the subject, imaged in the second volume data set based on features associated in general with said structures of no interest and based on expected distances from said surface of the structures of no interest of the subject, imaged in the second volume data set, to remain, based on features associated with said structures of

interest, and based on expected distances from the surface of the structures of no interest (see figure 2A, shows an image plane where structures 100, 210, 220 and 230 exists; after segmentation only the left and right lungs are shown in figure 2B). One skilled in the art would remove other structures that are not of interest because calculating edges on all the structures, shown in figure 2A of Uppaluri, will require more processing time, eliminating those unwanted structures, will save processing power.

The examiner will make a new grounds of rejection based on new references, Staehle and Uppaluri.

3. With regards to the double patenting rejection made in the previous rejection; the examiner will withdraw it in response to the amendments filed. The new amendments filed are not obvious against the copending application 10/721,936 in view of the cited references above cited reference.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1 - 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crook (US pat no 5,452,407) in view of Staehle (US pat no 7,120,298) and Uppaluri (US pub no 2003/0103665).

With regards to claim 1, Crook discloses a method to produce a volume date set, comprising

segmenting an image surface of a subject imaged in a first volume data set (see figure 5, as the first volume data set); and

transforming the first volume data set by filtering the second volume set, causing the segmented imaged surface and its environment to be transformed into a plane (the grids of figure 6 is read as second data set).

Crook does not disclose computationally uncurved and flattened representation of the segmented curved surface into a plane. Staehle discloses computationally uncurved and flattened representation of the segmented curved surface into a plane (the image in figure 4 is read as the curved image plane; the image in figure 4a is read as uncurved image plane). One skilled in the art would include computing the uncurved and flattened representation of the segmented curved surface into a plane because most images are read in their rectangular form, for example Cartesian coordinate system, which helps reading and locating coordinate much easier.

Crook and Staehle do not disclose producing a third data set to eliminate structures that are not of interest.

Uppaluri discloses producing a data set by filtering the second data set to filter out structures of no interest of the subject, imaged in the second volume data set based on features associated in general with said structures of no interest and based on expected distances from said surface of the structures of no interest of the subject, imaged in the second volume data set, to remain, based on features associated with said structures of interest, and based on expected distances from the surface of the structures of no interest (see figure 2A, shows an image plane where structures 100, 210, 220 and 230 exists; after segmentation only the left and right lungs are shown in figure 2B).
One skilled in the art would remove other structures that are not of interest because calculating edges on all the structures, shown in figure 2A of Uppaluri, will require more processing time, eliminating those unwanted structures, will save processing power.

With regards to claim 2, Crook discloses a method of claim 1, wherein the subject is a first subject and wherein at least one imaged second subject is disposed outside of the first subject (see figure 6, shows a human bone) and comprising filtering out the imaged second subject from the second volume data set with the non-interesting structures (see column 7, lines 39 to 43).

With regards to claim 3, an extension to the arguments to claim 1, Uppaluri discloses filtering the second volume set by edge-sensitive with at least one of the structures of no interest and the structures of interest (see figure 3, the filtering is done using "edgementation").

3. Claims 4 – 6 are rejected under U.S.C. 103(a) as being unpatentable over Crook ('407) in view of Staehle ('298) and Uppaluri ('665) as applied to claim 1 further in view of Essinger (US pat no 4,939,646).

With regards to claim 4, Crook and Herrington disclose all the limitations discussed in claim 1 including the first volume data set as a number of successive computed tomographic slice images, with image data slice image described with Cartesian coordinates (see figure 6), but do not disclose converting image data slice from Cartesian coordinate to polar coordinate. Essinger discloses performing a coordinate transformation for a slice image to polar coordinates with regards to a straight line that proceeds through the imaged subject and that is aligned substantially at a right angle to the individual slice images (see figure 4, element 43, the coordinate system of image in figure 3 is being convert to polar coordinate system, the image in figure 3 is a slice image of a three-dimensional object of a human), determining contours that are imaged in each transformed sliced image and that are associated with the imaged surface (see figure 4, element 44, the coefficients that are calculate are depends on the value points in the image slice in figure 3) and transforming the image points of the determined contours back into the coordinate system associated with the first volume data set (see figure 4, element 46).

Crook discloses extracting image points along the contours for representing the surface of the imaged first subject transformed according to a plane for generating a second

dataset (see figure 7b) and one would include re-extracting step because to display the results of the transformed coefficient, shown in Essinger figure 4, element 46. One skill in the art would include step of converting the image slices coordinate system from Cartesian to polar because to help detect radial edges on the image slice to find any unusual features present such as cancer, to improve recognition process.

With regards to claim 5, an extension to the arguments to the rejection of claim 4, Essinger discloses a fourth volume data set in which the image points of the third volume data set are transformed back into the coordinate system associated with the first volume data set (see figure 4, element 46).

With regards to claim 6, an extension to the arguments to the rejection of claim 4, Essinger discloses displaying an image associated with the fourth volume data set by volume rendering (see figure 4, element 46).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex Liew whose telephone number is (571)272-8623. The examiner can normally be reached on 9:30AM - 7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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10/20/07

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